APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/510,905	02/23/2000	John A. Thodiyil	SUN-P3992-JTF	3744

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EXAMINER
PHILPOTT, JUSTIN M

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _25 April 2003_ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-3,5-22 and 24-32_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-3,5-22 and 24-32_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _23 February 2000_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____ .

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Response to Amendment

1.   In the Amendment, filed April 25, 2003, Applicant has canceled claims 4 and 23, added

new claim 32, and amended claims 1-3, 5, 11-13, 24 and 30 to correct minor informalities and to

include limitations of the canceled claims. Applicant has also amended the specification to

correct minor informalities and accordingly the specification is no longer objected to. In the

remarks (page 12), Applicant declares that at the time of the invention both the instant

application and U.S. Patent No. 6,094,435 to Hoffman et al. were commonly owned by, or

subject to an obligation of assignment to, Sun Microsystems, Inc. Applicant also agrees to

submit a Terminal Disclaimer over Hoffman at the time the application may be in condition for

allowance. In view of the anticipated Terminal Disclaimer, Applicant has overcome the previous

rejections under 35 U.S.C. 103(a) in view of Hoffman. Furthermore, the pending independent

claims previously rejected under 35 U.S.C. 102(e) as being anticipated by Hoffman have been

amended to include limitations of the canceled claims which are not explicitly disclosed, but

rather are merely suggested, by Hoffman. Thus, in view of the amendments to the claims and the

anticipated Terminal Disclaimer, Applicant has overcome the previous rejections under 35

U.S.C. 102(e). In the following action, however, new rejections are made in view of other

previously cited art.

Claim Objections

2.   Claim 32 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 1.

When two claims in an application are duplicates or else are so close in content that they both

cover the same thing, despite a slight difference in wording, it is proper after allowing one claim

to object to the other as being a substantial duplicate of the allowed claim. See MPEP

§ 706.03(k).

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

4.   Claims 1-3, 5-7, 9-22 and 24-32 are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Patent No. 5,844,890 to Delp et al.

Regarding claims 1, 3, 11, 12, 24, 25 and 32, Delp teaches a method of scheduling data

(e.g., via cell scheduler 102 in FIGS. 1 and 2) for transmission over a communication link based

on priorities assigned to the data (e.g., see col. 5, lines 23-25 regarding multiple priorities of

traffic), comprising: receiving multiple descriptors (e.g., descriptors 206 in FIG. 2) at a

communication interface device, each of the descriptors describing a data portion having an

associated priority (e.g., see col. 6, lines 63-65 regarding data descriptors; and see col. 5, lines 34

– col. 6, line 53 regarding priority wherein the priority of the data corresponds with the priority

of the assigned timing wheel); storing the descriptors in a plurality of memories (e.g., see col. 6,

line 63 regarding queue of data descriptors) on the communication interface device, wherein

each of the memories is configured to store one or more of the descriptors describing data

associated with a predetermined priority; maintaining a dynamic weight (e.g., see col. 5, lines

49-56 regarding time slot window) for each of the plurality of memories, wherein each dynamic

weight corresponds to a threshold amount of data associated with the predetermined priority

(wherein the time slot window and bit rate determine the data amount); and servicing the

plurality of memories, wherein each servicing of one of the plurality of memories comprises: (a)

receiving a descriptor from the serviced memory (e.g., see col. 6, lines 65-67); (b) retrieving data

described by the received descriptor (e.g., see col. 6, line 67 – col. 7, line 2); (c) scheduling the

data for transmission via the communication link (e.g., see col. 7, lines 2-3); (d) determining

whether an amount of data scheduled during the servicing for transmission via the

communication link exceeds the threshold amount of data corresponding to the dynamic weight

for the serviced memory (e.g., see col. 8, lines 45-67 and FIG. 7 regarding checking whether

slow wheel boundary is crossed); (e) repeating states (a) through (d) for a next descriptor in the

serviced memory if the amount of data scheduled for transmission during the servicing is less

than the threshold amount of data (e.g., return from step 710 back to step 702); and (f) if the

amount of data scheduled for transmission exceeds the threshold amount of data, changing the

threshold for a next servicing of the serviced memory (e.g., see col. 9, lines 37-54 wherein a new

time slot is calculated). Further, regarding claims 3, 11 and 24, the combined steps of FIGS. 7,

7A and 7B inherently comprise determining whether one of the weights (e.g., time slot) has

changed and maintaining a first deficit proportional to the excess of the threshold (e.g., see steps

720 and 722). Further, regarding claim 25, Delp teaches an arbiter monitors an amount of data

received by means of step 720 (see FIG. 7A) and to be placed in a transmission queue (e.g.,

transmission preparation logic 208). While Delp may not specifically disclose that changing the

threshold for a next servicing comprises decreasing the threshold, it is well known in the art that

changing a threshold comprises either increasing or decreasing the threshold. Furthermore, by

decreasing the threshold for a next servicing when the amount of data scheduled for a

transmission exceeds the threshold in a current servicing, a fair or proportional amount of

bandwidth can be allocated wherein the excess use of allocated bandwidth occurring in the

current servicing is balanced with a reduced allocation of bandwidth for a next servicing.

Similarly, Delp specifically teaches a scheduling method which is designed to provide

proportional use of available network bandwidth (e.g., see col. 3, lines 15-21). Thus, at the time

of the invention it would have been obvious to one of ordinary skill in the art to decrease the

threshold of Delp in order to suitably provide proportional use of available network bandwidth as

suggested by Delp (e.g., see col. 3, lines 15-21).

Regarding claim 2, Delp teaches determining if the serviced memory contains a

descriptor (e.g., see col. 6, lines 31-42 regarding LCD).

Regarding claim 5, Delp teaches if any of the dynamic weights changes prior to the next

servicing, reinstating the pre-decreased threshold for the next servicing (e.g., see col. 9, lines 40-

48 wherein the new timestamp may equal the old timestamp with a sustained interval).

Regarding claim 6, Delp teaches determining if a first memory (e.g., corresponding to

entries on the slow timing wheel) of the plurality of memories contains less than a predetermined

number of descriptors (e.g., see col. 9, lines 19-23 regarding entries within a predefined segment)

and wherein a request to a host computer (e.g., computing system, see col. 5, line 3) would

inherently comprise identifying the first memory.

Regarding claim 7, Delp teaches the first descriptor (e.g., LCD 206) comprises an

identifier of a storage area (e.g., data cell queue 204 or slot in the timing wheel) on the host

containing the first set of data (e.g., cell) (e.g., see col. 6, lines 11-21 and FIG. 2).

Regarding claim 9, Delp teaches the dynamic weights are dynamically modifiable to

adjust the threshold amounts of data (e.g., see col. 9, lines 37-54).

Regarding claims 10 and 20, Delp teaches the interface device is a network interface

circuit (e.g., network interface 104 in FIG. 1) and the communication link is a network.

Regarding claim 13, while Delp may not specifically disclose setting the first deficit to

zero if a weight changes, it is inherent in the system of Delp for a threshold to change upon a

weight change and a change in the threshold inherently requires reconfiguring a deficit. Thus, at

the time of the invention it would have been obvious to one of ordinary skill in the art to set the

first deficit to zero if a weight changes in order to properly reconfigure the deficit upon a

changed threshold caused by a change in a weight.

Regarding claim 14, Delp teaches determining whether the first memory is empty (e.g.,

see col. 9, lines 19-23, e.g., wherein a first memory corresponds with a segment of the slow

timing wheel).

Regarding claim 15, Delp teaches, as discussed above regarding claim 1, entering an

additional servicing (e.g., terminating the first servicing turn and repeating steps (a)-(d)) if the

data scheduled for transmission exceeds the first threshold.

Regarding claim 16, Delp teaches incrementing a data counter (e.g., state(i), see col. 6, lines 11-53) and comparing the data counter to the first threshold (e.g., see col. 9, lines 37-54 regarding comparing timestamp and current time).

Regarding claim 17, Delp teaches the data unit is a cell (e.g., see col. 6, line 17) which inherently comprises a byte.

Regarding claim 18, Delp teaches the method as described above regarding claim 11, and further teaches servicing a second memory (e.g., next LCD) until it is determined to be empty (e.g., see col. 8, lines 18-44).

Regarding claim 19, Delp teaches a first memory corresponds to data having a highest priority (e.g., higher priority traffic, see col. 5, lines 25-28) and upon a weight change (e.g., reconfiguring scheduling) the first memory (corresponding to higher priority traffic) is the next memory serviced (e.g., see col. 5, lines 13-33).

Regarding claim 21, while Delp may not specifically disclose the first dynamic weight (e.g., corresponding to the time slot window) is approximately equal to a maximum packet size of the communication link, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a time slot which accommodates the maximum packet size of the communication link in order to suitably accommodate each packet which is to be processed on the communication link.

Regarding claim 22, while Delp may not specifically disclose the second dynamic weight is approximately equal to one, it is generally considered to be within the ordinary skill in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on

Appellant. <u>In re Mason</u>, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); <u>Marconi Wireless Telegraph</u>

<u>Co. v. U.S.</u>, 320 U.S. 1, 57 USPQ 471 (1943); <u>In re Schneider</u>, 148 F.2d 108, 65 USPQ 129

(CCPA 1945); <u>In re Aller</u>, 220 F.2d 454, 105 USPQ 233 (CCPA 1955); <u>In re Saether</u>, 492 F.2d

849, 181 USPQ 36 (CCPA 1974); <u>In re Antonie</u>, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); <u>In re</u>

<u>Boesch</u>, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Thus, at the time of the invention it would

have been obvious to one of ordinary skill in the art to have the second dynamic weight

approximately equal to one since it is generally considered to be within the ordinary skill in the

art to adjust, vary, select or optimize the numerical parameters or values of any system absent a

showing of criticality in a particular recited value.

Regarding claims 26 and 27, Delp teaches a loader (e.g., transmission selection logic cell

scheduler 102, see FIG. 2) configured to retrieve a first packet for placing in the transmission

queue (e.g., transmission preparation logic 208) during the servicing turn of the first memory,

and to load a next descriptor (e.g., LCD 206) for storage in a memory (e.g., queue of data

descriptors) (e.g., see col. 6, line 61 – col. 7, line 3).

Regarding claim 28, Delp teaches determining whether an amount of data data placed in

the transmission queue during the first servicing turn of the first memory exceeds a first

preferred amount of data to be placed in the transmission queue during the first servicing turn of

the first memory (e.g., see col. 8, lines 45-67 and FIG. 7 regarding checking whether slow wheel

boundary is crossed).

Regarding claims 29 and 30, see the above regarding claim 11.

Regarding claim 31, Delp teaches a multiplexer (e.g., switching/routing system 112, see

FIG. 1) configured to pass the descriptor corresponding to a first packet to the above-mentioned

arbiter and loader (e.g., cell scheduler 102) during the first servicing turn of one of the first and

second memory.

5.   Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Delp in view of

U.S. Patent No. 5,732,094 to Petersen et al.

Regarding claim 8, Delp teaches the method as described above regarding claim 1,

however, may not specifically disclose transmitting the data scheduled for transmission via the

communication link before the entire contents of a packet comprising the scheduled data are

scheduled for transmission. Petersen teaches packet transmission of data in a network via a

communications link similar to Delp and further teaches transmitting the data scheduled for

transmission via the communication link before the entire contents of a packet comprising the

scheduled data are scheduled for transmission (e.g., see Abstract, lines 8-12). Such transmission

by Petersen provides means for transmitting stream data wherein early sections of data packets

can be received and accordingly processed at an increased rate. Thus, at the time of the

invention it would have been obvious to one of ordinary skill in the art to apply this teaching of

Petersen to the method of Delp in order to transmit stream data wherein early sections of data

packets can be received and accordingly processed at an increased rate.

Conclusion

6.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Justin M Philpott whose telephone number is 703.305.7357. The

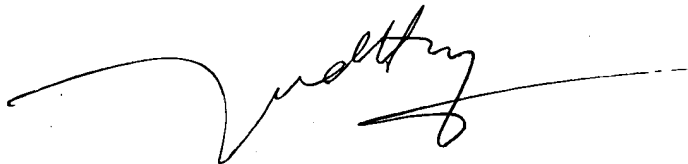examiner can normally be reached on M-F, 9:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Huy D Vu can be reached on 703.308.6602. The fax phone numbers for the

organization where this application or proceeding is assigned are 703.872.9314 for regular

communications and 703.872.9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 703.305.4750.

Justin M Philpott

June 17, 2003

HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600